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ABSTRACT

This document reports on the advancement of an instrument for assessing the elementary school educational environment of young children. Fifty-four public elementary schools (K-6) in Massachusetts were randomly selected. Educational environment was assessed in the sampled schools by having 5,412 fifth and sixth grade students respond to two forms of the Elementary School Environment Survey (ESES) consisting of 40 statements each concerning conditions and happenings characteristic of elementary schools. Students were asked to respond to each statement in ESES as a true or false description of their elementary schools. These responses were subjected to factor analysis and rotated along oblique axes. Six emerging factors were reviewed by 12 judges and contextually named: a) alienation, b) humanism, c) autonomy, d) morale, e) opportunism, and f) resource. A procedure for assessing environments and ways in which environmental information might be used are suggested. A 14-item bibliography is included. (Author/MJM)

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Dimensions of the Elementary School Educational Environment: A Factor Analytic Study

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This investigation identifies compelling dimensions of elementary school educational environment. More than 5,000 students in fifty-four randomly selected elementary schools responded to eighty statements about conditions and happenings existing in their schools as described in the Elementary School Environment Survey (ESES). These responses were subjected to factor analysis and rotated along oblique axes. Six emerging factors were reviewed by twelve judges and contextually named: (1) Alienation (2) Humanism (3) Autonomy (4) Morale (5) Opportunism (6) Resource.

The use of factor analytic procedures to identify and define important dimensions of elementary school educational atmosphere contributes to further significance and usefulness of the Elementary School Environment Survey. Individuals interested in an examination copy of ESES and information about ways the instrument can be used for fostering school renewal can write Robert L. Sinclair at the above address.

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Dimensions of the Elementary School Educational Environment: A Factor Analytic Study *

by

David Sadker and Robert L. Sinclair

Researchers and practitioners working in schools and classrooms to foster quality education quickly realize that improvement must be made in the total educational environment provided for learners. Only by altering school conditions which discourage learning and by building and maintaining compelling educational environments that foster learning will it be possible to create equal educational opportunity in which every child's aspirations are checked only by his or her individual limitations. Obviously greater knowledge about ways the environment in schools differ and are common can contribute to discovery of what conditions are most appropriate for certain learners. Yet, it is safe to say that, with a few exceptions, in the last twenty years there have been few contributions to instrumentation for assessment of environments in elementary schools.

It is particularly important for us to gain insight into elementary school climates because during this time of exposure to early environments children are most receptive to change. Bloom, for example, estimates from his results on general achievement, reading comprehension, and vocabulary development that by age nine at least fifty percent of the general learning pattern at age eighteen has been developed, and at

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* This paper is designed to compliment an oral presentation on the same subject. Therefore, the paper is purposefully brief to eliminate redundancy yet sufficently complete to advance necessary substance about factor analysis and environmental dimensions. Individuals interested in a more detailed written account of the investigation can write David Sadker.

least seventy-five percent of the pattern is established by about the age of thirteen.[1] The elementary school years appear to be very crucial in determining educational progress of the later years. And in order to increase our understanding of how varied educational surroundings affect students, we need to discover new and different ways to describe and analyze the diversity of elementary school climates. In fact the problems that are most alive in educational improvement today are the creation of more meaningful and efficient instruments to understand the school environment in which elementary youth live and learn. The purpose of this paper, then, is to report on the advancement of an instrument for assessing the elementary school educational environment of young children.

DEFINITION. Educational environment, as used in this study, includes physical, psychological, social and intellectual stimuli. By environment, we mean the conditions, forces and external stimuli which impinge upon the individual.[2]

Dewey concurred with this broad definition. He described environment as:

> ...the particular medium in which an individual exists which leads him to see and feel one thing rather than another...it strengthens some beliefs and weakens others ...it gradually produces in him a certain system of behavior...In brief, the environment consists of those conditions that promote or hinder, stimulate or inhibit, the characteristic of activities of a human being.[3]

This study determines the character of the school by asking students how they view the environment. Therefore Murray's concept of Beta press is utilized.[4] According to Murray, Beta press refers to the participant's unique interpretation of the environment. The "objective" perception of an environment by an outside observer is not employed in the present study. It is assumed that individuals do not act on the environment as described by an observer, rather, behavior is determined by their own perception of the environment.

PROCEDURE. All public elementary schools (K-6) in Massachusetts served as the universe from which fifty-four schools were randomly selected. Educational environment was assessed in the sampled schools by having 5,412 fifth and sixth grade students respond to two forms of the Elementary School Environment Survey (ESES)[5] consisting of forty statements each concerning conditions and happenings characteristic of elementary schools. The environmental statements were adapted from five environmental press categories (Practicality, Community, Awareness, Propriety, and Scholarship) developed by C. Robert Pace and found to be descriptive of college and university environments.[6] Students were asked to respond

to each statement in ESES as a true or false description of their elementary school.

The student responses were subjected to a factor analysis using each school as the unit of measurement. Each form (A and B) was treated as a separate analysis of forty statements. Fifteen statements with the lowest standard deviation were dropped from each form to avoid spuriously high correlations.[7] Using the squared multiple correlation in the diagonal of the correlation matrix, thirt en factors on Form A and twelve factors on Form B emerged. In order to determine the number of factors to rotate each set of factors was subjected to a scree test.[8] Nine factors on Form A and six factors on Form B were extracted as a result of the scree test. These unrotated factor matrices were transformed into an oblique rotation using the Harris-Kaiser 1964 solution.[9] A total of nine factors with significant statistical loadings emerged.

The statements associated with each of these factors were placed on separate cards and submitted to a panel of twelve judges. The judges working independently attempted to name each of the nine factors. Their classifications were used in identifying the factors and in revising the dimensions tested by the Elementary School Environment Survey (ESES).

The correlation matrices of the primary factors on Forms A and B are presented in Table 1. The items ordered by factor for each form are presented in Tables 2 and 3. The results of the factor analyses indicated that items in ESES should be redistributed among several of the new factors in order to better describe characteristics of elementary schools.

As the judges analyzed the statements within each factor, a consensus of opinion was reached on five of the factors on Form B and four of

TABLE I

Correlation Matrix of Primary Factors

Form A

Factors	1	2	3	4	5	6	7	8	9
1									
2	.27								
3	.42	.30							
4	-.19	.05	-.77						
5	-.22	.31	-.05	.28					
6	.25	.37	.07	.12	.06				
7	-.10	.21	.26	.36	.35	-.14			
8	-.09	.41	.06	.25	.37	.17	.28		
9	-.12	-.05	.06	.33	.25	-.15	.40	.14	

Correlation Matrix of Primary Factors

Form B

Factors	1	2	3	4	5	6
1						
2	-.14					
3	-.13	.08				
4	-.20	.00	.08			
5	.16	-.04	-.03	-.10		
6	.22	.21	-.07	-.04	.09	

the factors on Form A. This consensus indicated that several factors on each of the forms clearly were concerned with the same environmental constructs. As a result, in three cases, a factor on Form A and a factor on Form B were combined. The nine statistically significant factors on Forms A and B represented six environmental factors. These factors represent six dimensions of the elementary school environment as perceived by students.

TABLE 2

Items Ordered by Factor

Form A

Items	FACTORS I	II	III	IV	V	VI	VII	VIII	IX
10	.26		-.38						
8	.85								
24	.76								
19	.66								
9	-.54								
22		.82							
3		.57	-.50		.51			.36	.33
18		.53							.33
21		.50							
14			.78						
5				.84					
2				.63					
4					.69				
1		.35			.51				
6					.38				
23						.56			
25			.43			-.54			
20	.38					.42			
17							.90		
11							.76		
7					.34		.51		
15								.63	
13			.48				.37	.50	
12									.65
16	.40							-.33	.51

TABLE 3

Items Ordered by Factor

Form B

	FACTORS					
Items	I	II	III	IV	V	VI
6	.88					
4	.79					
21	.68					
7	.58					
25	.49					
12	.49					
9	.46					.37
20		-.78				
22		-.77				
13		-.66				
14	-.31	-.55	-.48			
3		-.42				
5			-.78			
1			-.58			
17			.55			
2	.33		.42			.31
15				-.72		
16				-.68		
8	-.38			.53		
23					.76	
24					.51	
18					.40	
12					.37	
19		-.34			.35	
10						-.81
11						-.78

As a result of this factor analysis, ESES was revised to reflect six new environmental dimensions. The importance and relationship of these variables to elementary schools are manifest in the following descriptions:

1. Alienation:

Environments which score low on this factor reflect the presence of a student body which feels involved in school affairs. A sense of belonging is emphasized in this environment, and this sense of belonging is buttressed by a concern for students. Students demonstrate their involvement by internalizing school objectives in such areas as academic pursuits and obedience to school rules and regulations. The atmosphere is congenial and there is a cohesiveness and a sense of togetherness in this climate.

A high score on this factor demonstrates a feeling of estrangement in the environment. This feeling of alienation could in fact lead to destructive acts perpetuated against the school itself.

In conclusion, this factor encompasses environmental characteristics such as cohesion, concern and a sense of involvement.

SAMPLE STATEMENTS

Most of the teachers care about problems that students are having.

Most students here care much about their school work.

2. Humanism:

The items in this factor reflect a concern for the value of the individual. It is a supportive climate and is marked by courtesy.

In addition, this value placed on the individual is carried over to his personal acts of expression: aesthetic expression. This climate demonstrates a concern for man's creativity, and is supportive of his poetry, music, painting and theatre.

A school characterized by this atmosphere is concerned with the integrity of the individual and a respect for his cultural and aesthetic expressions.

SAMPLE STATEMENTS

Most students are not interested in such things as poetry, music or painting.

Many of the teachers will go out of their way to help students.

3. Autonomy:

This factor suggests an environment which supports and encourages student independence. This climate suggests student initiative as well as autonomy. Emphasis on procedures and supervision are minimized. Self-direction rather than the obedience to rules of protocol is important. Individual differences, both in opinion and academic interests, are stressed. Another aspect of this environment is that the lines of communication are open and candid.

This environment affords the student the opportunity to share in the responsibility for his own learning.

SAMPLE STATEMENTS

Students almost always want to be called on before speaking in class.

Students often work in small groups of about 3 or 4 students without the teachers.

4. Morale:

The questions in this factor relate to student attitude towards the school. A high score on this factor indicates a friendly and cheerful school environment. This environment may be described as a happy one in which students and teachers have a warm relationship.

A low score on this factor indicates a negative student attitude towards the school, and may suggest poor relations between student and

teacher as well as disruptive student behavior.

This factor is concerned with student attitudes toward school, and the cooperating behavior which relates to such attitudes.

SAMPLE STATEMENTS

Many of the students here are unhappy about the school.

The students in this school feel as though they are one big family.

5. Opportunism:

The questions in this factor reflect an environment which is characterized by behavior which adapts to expediency or circumstance. A high score on factor suggests a climate in which one gains social and academic success by knowing how to behave with important and powerful people. Informal procedures and the importance of personal relationships are emphasized.

This environment seems to be categorized by entrepreneurial behavior and political maneuvering.

SAMPLE STATEMENTS

Students that the principal and teachers know will have it easier.

One way to get good grades in the school is to be nice to the teachers.

6. Resource:

The items in this factor reflect the amount of learning resources available to the students. The emphasis here is on the availability of in-class as well as extra-class resources. Included in this category are such resources as written materials, field trips, television, exhibits and music. The availability or friendliness of the teacher is also included in this dimension. Schools which score high on this factor offer a variety of learning resources to their students.

SAMPLE STATEMENTS

Teachers seldom take their classes to the library so that students can look up information.

Students may take books from the library shelves without the help of the librarian or teacher.

The six dimensions of the environment identified and assessed through ESES provide a fund of useful data about educational programs -- information which can be used to improve schools in a variety of ways. This paper now suggests a procedure for assessing environments and advances some ways that environmental information might be used, keeping in mind that the proposed uses are not at all inclusive.

DISCUSSION. The environmental dimensions generated by this factor analytic study indicate the uniqueness of elementary schools, and suggest the possibility that educational environments at the pre-school, secondary and graduate levels may also consist of unique climates.

An examination of the environmental dimensions in the sampled elementary schools reveals a strong emphasis on the affective domain including interpersonal relations, value and attitudinal development. Only the Resource factor is directly related to scholarship or cognitive domain. This finding is supported by personality and psychological theory which emphasize the development of the affective component during the child's early, formative years.

The study shows that selected components of the environment of elementary schools can be identified and assessed. This is a necessary initial step in understanding the learning process, since learning may be defined as resulting from an individual interacting with the environment. ESES can be used to assess elementary school climates and to provide information about the intensity of a school's score on each of the six

dimensions. Such data can provide valuable direction to educators who desire to create potent educational environments in order to have more impact on the effectiveness and appropriateness of learning fostered in elementary schools.

The lack of environmental measures has in part resulted in an underemphasis of the role of environment in the behavioral sciences.[10] This is an unfortunate circumstance since such scholars as Freud,[11] Erickson,[12] Piaget[13] and Bandura[14] among others, have provided powerful and varied thoughts on the significance of the impact environment has on human development. Until and unless genetic engineering is developed, the authors believe that educators must be environmentalists if they desire to improve learning in elementary schools. There is an urgent need for researchers and practitioners to more clearly determine how varied educational environments affect different ways children behave, think, and feel. The perfection of instruments to assess school environment is one necessary step for understanding the influence environment has on the learning of children.

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